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Fostering the development of non-technical competencies in medical learners through patient engagement: A rapid review

Favoriser le développement de compétences non techniques chez les étudiants en médecine grâce à la participation des patients : revue rapide

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Article abstract

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Methods: We conducted a rapid review of the literature to synthetize primary quantitative, qualitative and mixed studies (January 2000-January 2022) describing patient engagement interventions in medical education and reporting non-technical learning outcomes. Studies were extracted from Medline and ERIC. Two independent reviewers were involved in study selection and data extraction. A narrative synthesis of results was performed.

Results: Of the 3875 identified, 24 met the inclusion criteria and were retained. We found evidence of a range of non-technical educational outcomes (e. g. attitudinal changes, new knowledge and understanding). Studies also described various approaches regarding patient recruitment, preparation, and support and participation design (e.g., contact duration, learning environment, patient autonomy, and format). Some emerging practical suggestions are proposed.

Conclusion: Our results suggest that patient engagement in medical education can be a valuable means to foster a range of non-technical competencies, as well as formative and critical reflexivity. They also suggest conditions under which patient engagement practices can be more efficient in fostering non-instrumental patient roles in different educational contexts. This supports a plea for sensible and responsive interventional approaches.

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Reviews, Theoretical Papers, and Meta-Analyses

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Favoriser le développement de compétences non techniques chez les étudiants en médecine grâce à la participation des patients : revue rapide

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Abstract

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Résumé

Contexte : Pour former des médecins aptes à répondre aux besoins et attentes évolutifs des patients, les facultés de médecine doivent trouver des stratégies éducatives pour stimuler le développement de compétences non techniques chez les étudiants. Cet article vise à synthétiser les études qui traitent de la participation des patients à la formation médicale comme stratégie prometteuse pour favoriser le développement de ces compétences.

Méthodes : Nous avons effectué une revue rapide de la littérature pour synthétiser les études primaires quantitatives, qualitatives et mixtes (janvier 2000-janvier 2022) qui décrivent des interventions visant l'engagement des patients dans la formation médicale et qui font état de résultats d'apprentissage non technique. Les études ont été extraites de Medline et d'ERIC. Deux examinateurs indépendants ont participé à la sélection des études et à l'extraction des données. Une synthèse narrative des résultats est présentée.

Résultats : Parmi les 3875 études recensées, 24 répondaient aux critères d'inclusion et ont été retenues. Ces études font état d'apprentissages non techniques (par exemple, des changements d'attitude, des compréhensions et connaissances nouvelles). Les études décrivent également diverses approches de recrutement et de préparation des patients, et diverses manières de concevoir leur participation (par exemple, la durée du contact, l'environnement d'apprentissage, l'autonomie du patient et le format) et le soutien pédagogique qui en découle. Quelques suggestions pratiques émergentes sont proposées.

Conclusion : D'après nos résultats, l'engagement du patient dans l'éducation médicale constitue une avenue prometteuse pour favoriser le développement d'une panoplie de compétences non techniques, tout comme la réflexivité formative et critique des étudiants. Ils indiquent également certaines conditions et contextes éducatifs qui favorisent la participation non instrumentale des patients. Il s'agit d'un plaidoyer en faveur d'interventions éducatives centrées sur les besoins et préoccupations des acteurs impliqués et sur les particularités des contextes locaux.

Introduction

In recent decades, there has been a paradigm shift towards partnership approaches with patients at different levels of the healthcare system.[1] This new paradigm, often known as 'patient engagement,' has its roots in the democratic ideals of participation. It recognizes the relevance and value of patients' experiential knowledge[2] and requires patients to have an active and central role within their personal healthcare team. This paradigm also involves revising health professionals' training models towards a greater and more active role for patients,[3] beyond the instrumental roles historically assigned to them.[4,5]

Some authors suggest that the emerging phenomenon of patient engagement may be a promising strategy to foster the development of non-technical competencies in medical learners.[4,5] Such non-technical competencies refer to cognitive, social and personal skills, knowledge and attitudes that complement practical abilities and scientific knowledge to foster safety, efficiency, effectiveness and mindful awareness in medical practice, within a complex healthcare system.[6,7,8] These non-technical competencies can be broadly described as the human factors in healthcare.[6,7,8] Identifying and developing renewed ways to foster the development of such competencies (e.g., communication, team work and interprofessional skills, analytical and reflexive patient-centered skills)[8] are essential as those competencies could support a transformational effort for medical schools to: i. fill the gap between societal health needs and the educational system and; ii. reconnect with their social mission.[9,10]

Since 2019, our research team has been engaged in a large project aimed at developing, implementing, and evaluating an intervention actively involving patients in undergraduate medical training at Université Laval (Québec, Canada). As a first step of the project, we conducted a rapid review to synthesize evidence from qualitative, quantitative and mixed method studies in order to: i. identify the potential range of non-technical learning outcomes from educational interventions actively involving patients in medical training, and ii. gather evidence regarding practical aspects related to our interventional approach. This review differs from the other reviews on patient involvement in medical education[4,11,12,13] because it focuses specifically on the development of non-technical competencies in medical students. Indeed, in their review, Spencer et al.'s[11] proposed a framework for reviewing and monitoring patient involvement in specific educational situations. Jha et al.[4] along with Gordon et al.[12] provided a summary of evidence for the different strategies used to involve patients in medical education and the overall effectiveness of such involvement. Khalife et al.[13] examined the nature and factors influencing patient involvement in postgraduate medical learners' assessment. None of these reviews specifically addressed non-technical competencies nor approached the issue from a practical, intervention-guiding perspective. Our review provides an up-to-date and detailed picture of the available knowledge on this topic, as well as practical insights useful from an interventional angle.

As we focused on interventions based in Canada, the United States of America, Western European countries, and Australia, we believe that the evidence provided by our findings is relevant and has the potential to support decision making within many other comparable interventional contexts.

Methods

Search strategy

We used a systematic rapid review approach[14,15] to synthetize the current evidence regarding pedagogical practices involving patients in the development of non-technical competencies. The rapid review design aligns with our objective of feeding evidence into our interventional development process since this type of review allows to provide timely, evidence-based responses that are useful for decision-making purposes.[14,15] The search strategy has been co-developed with a specialist librarian and is described using Preferred Report Items for Systematic Reviews and Meta-Analyses (PRISMA).

Data sources

We searched two online databases that were targeted for their relevance to our research focus at the intersection of health and education sciences: Medline and ERIC. The first search was conducted on February 21st, 2019, and updated on January 9th, 2022. For each database, we performed a structured search using a pre-defined list of keywords and a search protocol (see Appendix A). We imported and collated the results of the database searches using Endnote software version X7.

Studies selection

In the first step of selection, one reviewer (JM) identified abstracts from the full corpus of search results. A second reviewer (SB) independently assessed a 10% sample of the corpus,[15] with a satisfying agreement rate (93.7%). In the second step of selection, the two reviewers (JM and SB) independently reviewed each full-text article to ensure their correspondence with the inclusion criteria. Any discrepancies were resolved by discussion. The inclusion criteria were the same for both abstract and full-text selection. Articles had to:

(1) be published in French or in English between January 2000 and January 2022;

(2) present a primary quantitative, qualitative or mixed methods study;

(3) describe one or more pedagogical interventions developed in an occidental country with comparable implementation contexts (e.g., Canada, the United States of America, Western European countries or Australia), set outside of clinical settings and actively involving real patients in the training of future physicians[a];

(4) report learning outcomes that relate to the development of non-technical competencies in medical students.

Data extraction and intervention assessment

The first author (JM) reviewed the selected studies and extracted data accordingly. The extracted data were entered into an Excel spreadsheet with the following headings: author(s), year of publication, title, population and sample size, study design, description of the intervention, degree of patient involvement and non-technical educational outcomes. The second author (SB) validated the extraction *a posteriori*. Any disagreement was discussed until a consensus was reached. When necessary, a third author (MCT) joined the discussion.

Data synthesis

JM performed a narrative synthesis “to provide an overview of the evidence identified, organized in an intuitive way, with the goal for providing knowledge users with a sense of the volume and direction of available evidence addressing the topic of interest.”[14(p.5)] The narrative synthesis focused on the interventions’ non-technical educational outcomes and on the interventional practices regarding: i) patient profile and recruitment strategies; ii) patient preparation and support; and iii. the modalities of active patient involvement in teaching. Towle et al.’s[5] taxonomy and the modified six-level Kirkpatrick classification were used.[16-18] Towle et al.’s[5] taxonomy (see Appendix B.1) is designed to guide the assessment of patient involvement in health professionals’ education and was used to qualitatively assess the degree of patient involvement in the different studies. The modified six-level Kirkpatrick classification[16-18] (see Appendix B.2) was used to categorise non-technical educational outcomes. This framework aims to categorise the levels of effect of a given educational intervention.[19] SB and MCT validated the data synthesis *a posteriori*. Any disagreement was discussed until a consensus was reached.

Results

Our search yielded 3875 documents after removal of duplicates. We retained 24 articles that met the inclusion criteria (see Figure 1).

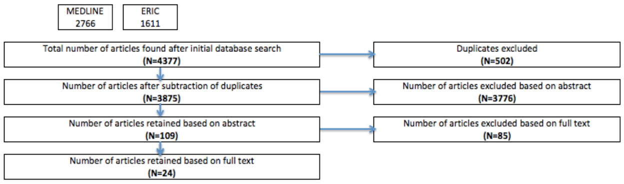

Figure 1. Rapid review search result flowchart

Study designs included quantitative (e.g., randomized control trial, pre-post design with or without a control group) (*n* = 8), concurrent or sequential mixed methods (*n* = 7) and qualitative studies (*n* = 9). Otherwise, the interventions reviewed varied widely in terms of objectives, characteristics, and outcomes. Appendix C presents a summary of the data extraction sheet.

Results regarding educational outcomes

The educational outcomes resulting from patient engagement in medical education are classified into four categories that correspond to four of the six levels of the Kirkpatrick classification: Level 1: reaction (i.e., learners' satisfaction, interest, motivation); Level 2a: changes in attitudes and perceptions; Level 2b: the acquisition of new knowledge, skills, and understandings; and Level 4a: changes in professional practice.

Reaction: an overall positive learning experience. Nineteen (19) articles reported student reactions to and appreciation for interventions actively involving patients.[20-38] A general conclusion is that students perceived patient engagement in medical training as a positive learning experience. Indeed, studies highlighted students’ enthusiasm[22] for this rich[36] and authentic experience,[25]

[aa] Interprofessional interventions were excluded to enable the better capture of specific effects of implemented interventions on medical students.

which they stated was helpful,[20,23,28] conducive to learning,[20,24] and a source of personal and professional growth.[23,29,37] The experience was perceived either as informative;[24] innovative and surprising;[29] fascinating and invaluable;[36] insightful, eye opening and enlightening;[34] powerful, motivating and inspiring;[28,34] disarming and engaging;[25,30,33] or supportive on a human level.[23] Accordingly, studies reported that students generally considered patient experiential knowledge sharing legitimate, valuable and important.[21,33,35,38] From a longitudinal perspective, Stojan et al.'s[38(p.57)] study also highlighted how their program graduates believed the experience was "an important step in their evolution to becoming a physician."

Aires et al.,[20] however, mentioned some negative student opinions regarding patient engagement in medical education. Those refer to i) the patient's non-expert status, considered incompatible with teaching medicine; ii) students feeling judged and insecure when expressing themselves in front of patients; and iii) certain patients' aggressive attitudes.

Positive attitude changes and renewed perceptions. Twenty-one (21) articles reported changes in attitudes and perceptions as a result of an educational intervention actively involving patients.[20,21,23-33,35-38,39-42] First, it led to changes in attitudes towards patients, particularly through a renewed awareness of common misapprehensions, myths and stereotypes regarding patients and their reality.[20,23,27,29,39] Some authors noted that patient engagement allowed students to see the patient as a fellow human being, not just a disease or a care plan,[23,34,36] which fostered a sense of humility.[36] For instance, Fitzpatrick et al.[27] highlighted that elderly participation in training improved student perceptions of senior patients as positive contributors to society, capable of effectively dealing with the challenges arising from modernity. Also, some interventions led to an enhanced student perception of patients as role models and mentors,[23] as valuable vehicles for learning,[21] as valuable actors in the healthcare system[20] and as relevant partners in their own care.[38,41] Several studies also highlighted an increase in empathy towards patients,[23-26,28,30,32,36] a renewed awareness of the patient's perspective of illness,[38] as well as recognition of the importance of seeing the patient's health trajectory from this perspective.[26,32,42]

Owen and Reay's study[35] also suggested that active patient involvement fostered positive attitudinal changes in students regarding social and psychosocial learning to be gained through their medical training. They pointed out that students actively interacting with patients with mental health disorders demonstrated a growing concern for developing i) a healthy and effective relationship with the patients, and ii) their ability to engage and understand the patient's reality.[35] From a longitudinal perspective, Stojan et al.[38(p.55)] also highlighted "how the interactions influenced the importance with which the program graduates viewed communication, empathy and compassion."

It was also suggested that patient engagement has contributed to the development of critical thinking about the self and the profession.[20,38,42] For instance, Kumagai et al.[42] mentioned that patient engagement led some students to critically question medical authority and the central role of physicians in the care process. They also highlighted that the experience led some students to reflect on their own social status and privileges as well as on "how complex the demands of life can be without those privileges."[42 (p.321)] Patient engagement also led students to remember that medicine is about people, as opposed to a biomedical disease-based view.[38] Along the same lines, Aires et al.[20] mentioned how students became more conscious of their own attitudes within the patient-doctor encounters.

Finally, educational interventions actively involving patients were also reported to be conductive to changes in the students' conception of their own future professional practice.[28,33,37,40-42] For Frey et al.,[28] patient engagement provided students with an opportunity to make sense of their academic journey and to concretely think of themselves as future doctors. Other studies outlined how patient engagement provided students with concrete insights into their future role as physicians,[40] stimulated their willingness to integrate lessons gained from patient stories into their own approaches to patients,[42] and to involve patients in managing their own care.[37] The finding of these positive attitudinal changes is, however, mitigated by the results of Harris et al.[43] In their randomized trial, they found that meeting chronically ill patients in the context of a home-based interview had no effect on students' patient-centered attitudes.

New knowledge, skills, and understandings. Beyond attitudes and perceptions, fourteen (14) studies also reported that patient engagement led to new knowledge, skills and understandings.[20,22,23,25-27,29,35-40,42] For instance, some studies pointed out how it allows students to better understand the practical meaning of good patient-doctor communication.[23,26,27,29] In particular, authors mentioned that interventions gave students a better understanding of the issues arising from communicating with some patients (e.g., seniors)[26] and the strategies to be implemented to interact more meaningfully with them.[29]

Beyond communication, some studies reported students' learning about patient-centered care and its implications for medical practice.[20,33] In particular, Aires et al.[20] reported that students gained knowledge in a range of patient-centered fields, such as users' rights, healthcare ethics, health democracy, patients' healthcare trajectories and the healthcare system's organization.

Studies also outlined the effects of active patient involvement in fostering learning about the social determinants of health[36,40] and other psychosocial aspects patients have to deal with.[20,22,36,37] It was highlighted that by contextualizing illness, the active involvement of patients might be conducive to new knowledge and understandings about how illness can affect patients and families on a day-to-day basis and impact the way they interact with the world.[20,34,37-39,40,42] It was also suggested that the experience might lead to a better general understanding of the plurality of health trajectories[26,27,34,37,39,42] and of patients' and families' response to illness.[34,37,38] In particular, understanding the importance of the patient's social support,[34] the barriers patients face while accessing community resources and healthcare, and the role these aspects play in their health trajectory[36,37,42] were also important learning gained from active patient involvement.

Finally, some studies[23,39] highlighted the role of patient involvement in medical training in students' improved understanding of the benefit of interdisciplinary practice to provide optimal care. The understanding of the importance of the doctor-patient relationship[39] as well as how meaningful and impactful each interaction feels for patients[34] were also mentioned.

Changes in professional practice. By taking a longitudinal perspective, Stojan et al.[38] provide some insight into the long-term impacts of a patient engagement educational intervention on medical practice. In particular, the authors highlighted how their program influenced i) participants' approaches to delivering bad news, and ii) their strategies for establishing partnerships with patients.[38] Moreover, they mentioned that their program graduates, as clinical teachers and role models, were more likely to emphasize the importance of the patient perspective to their learners.[38]

This section has identified positive educational outcomes that can be expected from an intervention actively involving patients in medical education. Based on these results, the following section addresses practical aspects regarding patient engagement that promotes the achievement of such positive non-technical outcomes and proposes corresponding recommendations.

Results regarding patient engagement practices

Patient profile and recruitment strategies. Several studies (*n* = 17) reported recruiting patients based on clinical (e.g., chronic disease)[21,22,24,25,28,30,31,36-38,40,42,43] or socio-demographic (e.g., age)[26,27,29,32] criteria. In those cases, the profile of involved patients often coincided with a specific objective, such as fostering more favorable attitudes towards a given group of patients, understanding those patients' specific reality, or gaining clinical insights from them.

In a few other studies (*n* = 3), patient recruitment was more focused on the lived experience than on their specific profile.[33,35,41] For instance, in Owen and Reay's study,[35] one key criterion required patients to have lived experience with healthcare. Also, Jha et al.[33,41] involved patients with personal experience of medical errors or harm in medical diagnosis, treatment or care, which was consistent with the course's theme (i.e. patient safety).

In Kangasjarvi et al.'s study,[34] recruitment was done on a more practical basis, targeting individuals who had already demonstrated an interest in participating in medical education or who were already involved as advisors. Along the same lines, Aires et al.[20] targeted patients already belonging to a patient organization.

Some studies (*n* = 4) also specified a few skills, abilities and attitudes that patients must demonstrate to qualify for participation.[20,22,28,35] For example, Bideau et al.[22] looked for patients who showed good intellectual levels and good communication skills. For others,[28,35] previous experience and skills in teaching, mentoring, or talking in front of groups were also considered relevant. Aires et al.[20] looked for patients with good health and experiential knowledge, a clear idea about the key messages to convey, and a kind attitude toward students. Player et al.[36 (p. 369)] also stressed the importance of making sure patients were "at a suitable place in their journey" to be able to adequately share their story. Cumberland et al.[23] finally mentioned logistical recruitment criteria concerning patients' availability and their access to transportation.

A few studies (*n* = 11) detailed the recruitment strategies used to effectively engage patients to participate.[22,23,26,27,29,33,35,36,39,41,43] Some outreach strategies used to disseminate recruitment needs are cited (e.g., involvement of partnering community actors[22,23,26,29] or care teams;[36,43] collaboration with patient networks;[33,41] advertising in community media[33,41] or in various community events;[23] and the mobilization of champions/ambassadors[33,41]). By adapting strategies to target group realities, Fitzpatrick et al.'s[27] ensured diversity and representativeness. One study also mentioned patient involvement in a steering committee to oversee the project, including determining an approach to patient recruitment.[35] Finally, a study mentioned the need to consider that some patients may withdraw from the program along the way or be unable to attend certain sessions and thus propose the recruitment of patient dyads.[35]

From these results, four practical recommendations emerge:

- Align participants' profiles and recruitment criteria with the interventional objectives, requirements, and contextual constraints.
- Define recruitment strategies that are tailored to the persons/groups you want to reach.
- Consider involving patients in the co-design of these recruitment strategies to support their relevance and effectiveness.
- Recruit enough patients to be able to compensate for ups and downs and for absences.

Patient preparation and support. A few articles (*n* = 7) provided detailed information on the initial preparatory training patients received to fulfill their role.[22,33-35,37,40,41] The reported training activities vary widely in terms of format and duration. At one end of the spectrum some interventions involve long-term preparation comprising several training sessions of a few hours each.[22, 35] At the other end of the spectrum, patient training consists of the distribution of written guides.[40] Extended preparation often seems to be associated with particularly high patient involvement and independence levels. For instance, Owen and Reay's[35] intervention, in which patients were asked to independently facilitate and participate in tutorials, proposed six weekly 1.5-hour tutorials. Similarly, Bideau et al.'s[22] intervention, requiring patients to teach complex clinical content, included extensive preparation.

Some studies (*n* = 5) also reported initiatives to provide additional support to participating patients.[23, 27, 33, 35, 41] For instance, Cumberland et al.[23] suggested organizing group socialization events, thus highlighting the value of establishing a sense of community. Owen and Reay's study[35] suggested holding occasional in-session training activities to review the fundamental elements covered in initial training. Additional support also sometimes took the form of debriefings. For some, this debriefing took place after each encounter and allowed to discuss what went well, what needed to be improved, and how the patients felt.[33, 35, 41] In other cases,[23, 27] the debriefing took place during a closing event, where patients and students reflected together on their shared experience.

The following practical recommendations are derived from the results:

- Provide patients with training that is consistent (in terms of content and length) with their assigned mandate, what is expected of them and what they need.
- Develop strategies to stay attuned to patients' needs in terms of training and support (e.g., through recurring debriefings).
- Consider organizing activities to foster a sense of community and to allow a collective reflection about the shared experience.

Patient involvement duration, environment, content and form. The duration of the contact between patients and students varied. It ranged from one-off events/encounters[22,25,28,30,31,33,41,43] to longitudinal or continued contacts, occurring over several years of medical training.[27,32,37,38,40,42] During the on-off events, patient involvement was often closely linked to the course content. The longitudinal contacts were more aimed at exposing students to patients' stories and trajectories, to foster their understanding of the personal and psychosocial aspects of illness and care and to elicit their positive views and attitudes.

Besides duration, a few studies (*n* = 6) highlighted how the learning environment was important to facilitate a positive interactive experience between students and patients.[25,27-29,33,34] Some studies reported that psychologically safe small group settings allowed for constructive criticism, in-depth and meaningful interactions, and a more personalized experience.[25,28,33] Such a safe environment appears particularly important since some authors[20,33] pointed out how patients' harsh criticism or 'doctor-bashing' discourse can arouse insecurity and fear in students and ultimately impede learning. It was also highlighted how students exposed to patient engagement appreciated a learning environment that allowed for a slower pace, providing them time to listen, reflect and learn from patients' in-depth stories.[27-29,34]

Finally, it has been noted that some learners may question whether the patient's experiential knowledge is effectively contributive to the achievement of pedagogical objectives and the enhancement of medical skills.[20,31,33] In response to this challenge, some authors[31,33] stressed the importance of paying attention to content and form. They highlighted how telling patients' stories with a clear structure and take-home messages while maintaining a clear link with the pedagogical objectives and focussing on the personal experience of disease and healthcare further promoted students' engagement and trust in the learning process.[20,31,33]

Patient involvement and autonomy in planning, and during the encounter. A few studies (*n* = 10) reported the level of patient involvement in planning educational interventions.[20,24,25,27,31-35,41] This ranged from a full-partnership with patients,[20,33-35,41] where patients were involved in co-determining educational priorities and objectives, co-reviewing or co-developing educational content, to faculty-led initiatives suggesting some degree of control or supervision by the faculty-staff in the planning of the encounter.[24,25,27,31,32] For instance, Fitzpatrick et al.[27] reported an intervention where module topics were selected using the *American Geriatric Society Core Competencies for medical student education* and where faculty members were responsible for defining the specific learning objectives and modules to be delivered by patients. Similarly, some studies (*n* = 21) reported different levels of patient autonomy within the learning encounter.[20-22,24-26,28-31,33-43] At one end of the spectrum we found interventions in which patients were the only ones responsible for teaching, with no formal faculty involvement.[31,35] At the other end of the spectrum, studies reported some degree of faculty control and supervision within the encounter.[21,22,24-26,28,30,36,38-40,42,43] For example, in the intervention discussed by Bideau et al.,[22] two specific periods were allotted for patient feedback whereby they were required to focus on faculty-identified priority topics. Once again, the level of patient involvement and autonomy appears to depend very much on the underlying pedagogical objectives, as patients were left with less room when their participation was seen as a tool for teaching predefined contents, and more room when the desired learning was directly related to their experiences and views.

These results suggest the following practical recommendations:

- Align the contact duration and the level of patient involvement and autonomy with the learning objectives (e.g., to illustrate and concretize theoretical content or to foster deeper reflection rooted in patients' experiences and views) and the characteristics of the educational context.
- Train, support and mobilize the actors involved (e.g., patients, students, faculty members) to establish and maintain a caring and psychologically safe learning environment.
- Adapt the pedagogical formula to allow for a slower pace that will foster meaningful interactions, personal introspection, and group reflection.
- Support patients in the formulation of a clear and targeted discourse, where they speak as experts on their own lives.

Discussion

In our rapid review, we synthetized the results of 24 primary qualitative, quantitative and mixed-methods studies on educational interventions that actively involved patients in medical training that foster the development of non-technical competencies. On the practical side, the review exposes the wide-open possibilities for trying new interventions and evaluating them to describe how patient engagement might be used to foster non-technical learning. However, based on our results, it is difficult to support one approach over another. The approaches to be favored seem to depend strongly on the objectives of the interventions and local pedagogical contexts. Our review indeed highlights that there is too much variety in intervention design and too little data on long-term benefits to offer definite best practices for patient engagement in the medical curriculum.[4] This conclusion is consistent with Patton's critique of the formulation of 'best practices' facing complex human and social situations.[44] The author explains how simple problems translate into a linear logic in a way that can be standardized in 'best practices.' He however argues that such standardized best practices may not be suitable for emergent and dynamic interventional situations, influenced by unavoidable differences in people's and communities' needs, expectations, and experiences and in implementation contexts.[44]

That said, our review allowed us to identify a certain number of broad practical avenues and principles that may guide the interventional practices of patient engagement in medical education (see Table 1 for a summary). From those insights emerges a plea for a sensible and responsive interventional approach different from an approach that gives priority to evidence over the needs, concerns, priorities and preferences of the actors involved and the characteristics of the local context. This suggests that the results of this review could be used as a starting point to open discussion with local actors to better co-define the interventions engaging patients in medical training. Such a proposal is consistent with the deep roots of patient engagement[1,2] and more broadly with participatory approaches in intervention and evaluation, which promote partnerships with people and communities and emphasize the complementarity of knowledge to co-design transformative initiatives and processes.[45,46]

Finally, despite the diversity of approaches to patient engagement, the results of this review highlight students' positive reaction, attitudinal changes and the gain of new knowledge, skills, and understandings. They also suggest potential effects on medical practice.[38] The results are thus generally consistent with other reviews concluding in the positive learning outcomes of patient engagement in medical training.[4,12] Moreover, our review identifies patient engagement as a promising way to specifically support the development of non-technical competencies. In particular, following Tremblay et al.,[47] our results suggest patient engagement in medical training may lead to the development of a certain level of formative reflexivity, aimed at improving students' professional practice. In addition, our findings suggest that patient engagement can lead to the development of a more critical form of reflexivity "aimed at raising the professional's [or student's] awareness and critical conscience from a broad social system perspective."[47(p.540)] Our review thus contributes interestingly to the growing body of literature suggesting patient engagement may be an avenue to foster the development of reflexivity in future physicians.[4,5]

Table 1. Summary of practical insights

Practical aspects	Recommendations
Patient profile and recruitment strategies	Align participants' profiles and recruitment criteria with the interventional objectives, requirements, and contextual constraints. Define recruitment strategies that are tailored to the persons/groups you want to reach. Consider involving patients in the co-design of these recruitment strategies to support their relevance and effectiveness. Recruit enough patients to be able to compensate for ups and downs and for absences.
Patient preparation and support	Provide patients with training that is consistent (in terms of content and length) with their assigned mandate, what is expected of them and what they need. Develop strategies to stay attuned to patients' needs in terms of training and support (e.g., through recurring debriefings). Consider organizing activities to foster a sense of community and to allow a collective reflection about the shared experience.
The modalities of active patient involvement in teaching	Align the contact duration and the level of patient involvement and autonomy with the learning objectives and the characteristics of the educational context. Mobilize the actors involved (e.g., patients, students, faculty members) to establish and maintain a caring and psychologically safe learning environment. Adapt the pedagogical formula to allow for a pace that will foster meaningful interactions, personal introspection, and group reflection. Support patients in the formulation of a clear and targeted discourse, where they speak as experts on their own lives.

Limitations

Results of this study should be interpreted while taking their limitations into account. The use of a rapid review design and some strategic choices involving the literature search (e.g., the use of only two databases) may have limited the scope of the review. Although this strategy was rigorous and well-adapted to our objectives, we acknowledge some relevant studies may have been missed.

Non-technical competencies are a category of skills, knowledge, and attitudes with relatively blurred boundaries.[7] In this review, non-technical competencies relied on a consensual definition (based on scientific literature[6,7,8]) and the interpretation of the authors (supported by methodological rigor).

Another limitation in these results is the lack of information on cost and sustainability. Although it was not the purpose of our review to focus on these issues, we acknowledge that given current fiscal and budgetary restrictions, more evidence is required on these matters to adequately support decision-making.

Conclusion

This review contributes to the establishment of patient engagement as a valuable means of teaching and learning non-technical competencies. Our results also provide promising insights for the development and implementation of sensible and responsive educational interventions involving patients in medical education, more in line with local realities, needs and expectations. More rigorous interventional research is needed to optimize patient engagement practices in medical training, to further justify the merits and relevance of this pedagogical practice and to document its ultimate impact on health practices' transformation.

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Appendix A. RESEARCH STRATEGY

MEDLINE (OVID)
Patient Participation
1. Patient Participation/
2. Community Participation/
3. ((Patient* or public* or communit* or user*) adj2 (involv* or participat* or partner* or volunteer* or engag* or narrative*)).ab,ti.
4. #1 OR #2 OR #3
Medical education
5. Education, Medical/
6. Education, Medical, Graduate
7. Education, Premedical/
8. Education, Medical, Undergraduate/
9. Students, Premedical/
10. Students, Medical/
11. (Medicine* or Medical* or premedic* or physician* or doctor*) adj3 (education or training or learning or curriculum or education* program* or teaching or schooling* or pedagog* or instruction* or course*).ab,ti
12. #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11
13. #4 AND #12

ERIC (OVID)
Patient Participation
1. Patients/
2. Citizen Participation/
3. Community Involvement/
4. ((Patient* or public* or communit* or user*) adj2 (involv* or participat* or partner* or volunteer* or engag* or narrative*)).ab,ti.
5. #1 OR #2 OR #3 OR #4
Medical education
7. Graduate Medical education/
8. Medical Education/
9. Premedical Students/
10. Medical Students/
11. (Medicine* or Medical* or premedic* or physician* or doctor*) adj3 (education or training or learning or curriculum or education* program* or teaching or schooling* or pedagog* or instruction* or course*).ab,ti
17. #7 OR #8 OR #11 OR #12 OR #15
18. #6 AND #17

Appendix B. Frameworks used for qualitative assessment of the reviewed interventions

1. Towle's taxonomy of the spectrum of patient involvement in medical education[5]

A	B	C	D	E	F
Degree of patient active involvement in the learning encounter	Duration of contact with the learner	Patient autonomy during the encounter	Training for the patient	Patient involvement in planning the encounter and curriculum	Institutional commitment to patient involvement in education
1.Paper-based or electronic case or scenario.	None	N/A	N/A	None	Low
2.Standardized or volunteer patient in a clinical setting	Encounter-based	None	None	None	Low
3.Patient shares his or her experience within a faculty-directed curriculum	Encounter-based	None-Low	Brief, simple	None	Low
4.Patient-teacher is involved in teaching or evaluating students	Variable	Moderate	Structured, extensive	Low-Moderate	Low-Moderate
5.Patient-teacher as equal partners in student education, evaluation and curriculum development	Moderate-Extensive	High	Extensive	Moderate-Extensive	Moderate
6.Patient involved at the institutional level in addition to sustained involvement as patient-teacher in education, evaluation and curriculum development	Extensive	High	Extensive	High	High

2. The modified six-levels Kirkpatrick classification[17-19]

Level of impact of an educational intervention	Description
Level 1	Reaction; perception of training by the students
Level 2a	Change in student attitudes, views, and perceptions
Level 2b	Gain of new knowledge, skills, and understandings
Level 3	Change in student behaviour
Level 4a	Change in professional practice
Level 4b	Change in patients' condition

Appendix C. Summary of the data extraction sheet

Authors	Year	*Title*	Study design	Population and sample size	Intervention for active patient involvement	Level of patient involvement	Non-technical learning outcomes
Aires MJ, Gagnayre R, Gross O, et al.[20]	2019	*The Patient Teacher in General Practice Training: Perspectives of Residents*	Sequential mixed methods design (qual -> QUANT) using semi-structured interviews and focus groups (pre) and a survey with open comments (post)	*n* = 7 patients, 8 physician teachers, and 9 general practice residents (pre) *n* = 124 general practice residents (post)	Program involving classroom teaching and reflective practice groups (GEPRIs) aimed at developing critical thinking skills. Intended for general practice residents (GPRs). During a GEPRI, three GPRs present and analyse clinical situations they have encountered during their residency in a small group setting. With the aid of the instructors, the group analyses the clinical, psychological, and social aspects of those situations. Patients helped design lessons, taught on their own, and taught in tandem with a physician. Patients also participated in the educational assessment of the GPRs.	Duration of the contact: N/A Patient autonomy during the encounter: Moderate (patients teach a class on their own and teach in tandem with a physician teacher in 80% of the GPRs' classes). Training for the patient: N/A Patient involvement in planning the encounter and curriculum: Moderate-High (patients are members of the teaching committee and of a steering committee responsible for the program development) Institutional commitment to patient involvement in education: N/A	Students globally reported a positive, useful learning experience and the development of some patient perspective-related competencies. They mentioned gaining a more complete view of the patient experience. They also reported becoming more conscious of their own attitudes. The study also reported some negative student opinions regarding the program.
Barr J, Bull R, Rooney K[21]	2015	*Developing a patient focussed professional identity: an exploratory investigation of medical students' encounters with patient partnership in learning*	Descriptive qualitative study design using open-ended questions added into the student evaluation questionnaire, focus groups and semi-structured interviews	*n* = 65 (open-ended questions), *n* = 14 (focus groups), *n* = 8 (interviews)	Patient-partner program promoting a patient-centered approach to the learning and delivery of medical care in the context of chronic and complex illness management. Intended for senior medical students. Involved volunteer community members living with and managing chronic illness. Small groups of 3-4 students meet with a patient-partner in teaching rooms set up like consulting rooms. Students have the opportunity to develop their history taking, basic examination, communication, professionalism and management skills. A general practitioner facilitates and mentors each group.	Duration of the contact: Encounter-based (1-h meetings held once a week with different patients each week, throughout the academic year) Patient autonomy during the encounter: Low-Moderate (Patient views and feedback are sought during each session) Training for the patient: N/A Patient involvement in planning the encounter and curriculum: N/A Institutional commitment to patient involvement in education: N/A	The program was perceived to enable constructive criticism in a safe, small group setting. The value of learning through the exploration of stories was acknowledged. Experience allowed an increased level of comfort in interacting with patients. Being presented with the unknown was perceived to be more manageable after the encounters. Some students showed progress in the development of their professional identity.
Bideau M, Guerne PA, Bianchi MP, Huber P[22]	2006	*Benefits of a programme taking advantage of patient-instructors to teach and assess musculoskeletal skills in medical students.*	Qualitative study design using pre- and post-test open questions compared with a performance record form (pre-test) and physical status record form (post-test)	*n* = 61	Involvement of patient-instructors (1) to teach aspects of history taking in the context of a chronic inflammatory disease, and the examination of affected joints and (2) to provide direct constructive and didactic feedback on the overall approach to the patient. Special emphasis on psycho-emotional and physical consequences of chronic diseases. Intended for all third-year medical students. Involved patients living with rheumatoid arthritis. The session was structured as follows: (1) first, 20 min of history taking, followed by 10 min of patient feedback; (2) a 30-min physical examination with continual patient teaching. Patients were instructed to stick closely to	Duration of the contact: Encounter-based (1x60-min encounter) Patient autonomy during the encounter: Low (Patients are invited to provide feedback and teaching but within a faculty-predefined framework) Training for the patient: Extensive (30-h training on mostly clinical and formal contents i.e. history taking, physical examination of the knee and hand, how to use the evaluation tool to assess	Students showed enthusiasm for the program. Results show that the intervention especially improved their understanding of the psychosocial consequences of chronic illness.

					faculty-provided standards in the formulation of their feedback and teachings. At the end of the 30 min, patients gave students feedback about their general performance and attitude.	students' performance. Additional teaching and training were provided whenever necessary.) Patient involvement in planning the encounter and curriculum: N/A Institutional commitment to patient involvement in education: N/A	
Coe TM, Chirban AM, McBroom TJ, et al.[39]	2021	*Virtual student-transplant patient interactions empower patients and enhance student transplantation knowledge*	Concurrent mixed methods study design (QUANT+QUAL) using post-test surveys and focus groups	*n* = 33 (surveys) *n* = 43 (focus groups)	Program involving the pairing of medical students with transplant patients for virtual non-medical interactions. Aiming to enhance exposure to transplantation during surgery clerkship despite the COVID-19 pandemic. Intended for medical students completing their core surgery clerkship. Students were provided with the patient's contact information and were advised to establish a mutually convenient time for a 30- to 60-minute conversation (on the phone or with a video interface).	Duration of the contact: Encounter-based (1x30- to 60-min encounter) Patient autonomy during the encounter: Low-Moderate (Students and patients were provided a discussion guide that outlined general questions focused on the patient's experience to guide the interaction) Training for the patient: N/A Patient involvement in planning the encounter and curriculum: N/A Institutional commitment to patient involvement in education: N/A	Students reported learning about patients' diverse experiences of the medical trajectory, the disease's impact on patients' support system and the importance of the doctor-patient relationship, the essential nature of a multidisciplinary team in providing optimal care and the deep connection patients develop with their care team. Changes in attitude toward patients and their reality were also highlighted.
Cumberland DM, Sawning S, Church-Nally M, et al.[23]	2019	*Experiential Learning: Transforming Theory into Practice through the Parkinson's Disease Buddy Program*	Concurrent mixed methods study design (QUANT+QUAL) using pre- and post-test surveys involving rating scales and free text comments and focus groups conducted at the start, middle and conclusion of the program.	*n* = 22 (pre- and post-surveys, Year 1) *n* = 13 (pre- and post-surveys, Year 2) *n* = 6 (focus group, initial, Year 1) *n* = 5 (focus group, midpoint Year 1) *n* = 4 (focus group, conclusion Year 1) *n* = 3 (focus group, initial, Year 2) *n* = 8 (focus group, midpoint Year 2) *n* = 5 (focus group, conclusion Year 2)	Service-learning program involving the pairing of medical students with Parkinson's patients with the aim of i. improving students' knowledge about the disease, ii. improving students' attitudes toward geriatric patients suffering from a chronic neurodegenerative disease and iii. boosting students' interest in the field of neurology. Intended for 1st-year medical students. The program encouraged participants to engage in a social relationship over the course of the academic year. Participating students also committed to attend a monthly 1-hour neurologic seminar involving PD patient panels. The program involved a launching event, group events and a wrap-up event to allow buddy pairs to socialize.	Duration of the contact: Extensive (2-3 hours per month over 9 months) Patient autonomy during the encounter: N\A Training for the patient: N\A Patient involvement in planning the encounter and curriculum: N/A Institutional commitment to patient involvement in education: N/A	The overall experience was considered positive. Students felt they benefited from the relationship with their buddy. The program allowed a bonding experience. Data suggest an improvement in the attitude towards caring for Parkinson's patients and a rise in empathy. Communication skills improvement and understanding of the importance of interdisciplinarity were also outlined.
DeSipio J, Gaughan J, Perlis S, Phadtare S[24]	2018	*Use of Real Patients and Patient-Simulation-Based Methodologies for Teaching Gastroenterology to Pre-Clinical Medical Students*	Concurrent mixed methods study design (QUANT+qual) using post-test surveys involving rating scales and free text comments +	*n* = 37 (evaluation of the intervention) *n* = 77 (standard evaluation of the course)	Intervention involving real patients and patient simulation-based methodologies to teach gastroenterology to second-year medical students. Intended to demonstrate bio-psychosocial aspects of clinical practice. Involved 6 patients who participated in various sessions throughout the course. Patients were each suffering from a different gastrointestinal disorder.	Duration of the contact: Encounter-based (brief encounters, the exact number is not specified) Patient autonomy during the encounter: Low (few spaces for feedbacks and meaningful interactions with students outside the pre-formatted	Students received the approaches very positively. For most students, patient involvement was considered informative, enhanced their empathy, and was conducive to learning.

			standard course evaluation analysis		Course director met with the patients before the encounter to learn about their disease, the symptoms experienced, the treatments undergone and the bio-psychosocial aspects of the disease with the objective of pre-formatting question-and-answer encounters with patients conceived as content experts. Some patients also participated during optional lectures and an interactive session.	question-and-answer encounters) Training for the patient: N/A Patient involvement in planning the encounter and curriculum: Low-Moderate (patients were considered content experts, content was based on their experience of the disease, key features from each discussion were shared with patients for accuracy, but still into a faculty-led curriculum) Institutional commitment to patient involvement in education: N/A	
Dickinson BL, Lackey W, Sheakley M, Miller L, Jevert S, Shattuck, B[25]	2018	*Involving a real patient in the design and implementation of case-based learning to engage learners*	Non-experimental quantitative study design using post-test questionnaires involving rating scales and open questions	*n* = 85	Intervention involved a real patient in the design and implementation of a case-based learning (CBL) event. Intended to increase the learner's engagement in the second-year Gastrointestinal Systems course of the preclinical curriculum. Involved a 26-yr-old Caucasian male diagnosed with acute alcoholic liver failure and hepatorenal syndrome. A semi-structured interview was used to elicit the patient's narrative. The patient's medical history, imaging studies, laboratories, physical exam findings intake and discharge synopses were also collected. The recorded narrative served as the foundation for drafting multiple-choice and open-ended questions for the CBL. A team of biomedical science faculty and clinician faculty drafted the CBL. A 20-min period was reserved at the close of the case for students to meet the patient and ask questions.	Duration of the contact: Encounter-based (one-time encounter) Patient autonomy during the encounter: Low-Moderate (e.g., narrative formatted within the confines of a faculty-led pre-recorded semi-structured interview, 20-min patient-student interaction at the end of the encounter that allowed patient feedback) Training for the patient: N/A Patient involvement in planning the encounter and curriculum: None-Low (A semi-structured interview was used to elicit the patient's narrative, to be used as a tool to teach faculty-led curriculum within a relatively rigid CBL format; the patient was not involved in the drafting of the CBL) Institutional commitment to patient involvement in education: N/A	Students reported that the experience facilitated increased engagement in class and an increase in the depth of discussions. It was also considered an authentic learning experience. Most students also reported the experience eliciting empathic feelings. The experience helped students apply basic science concepts to the clinical material, helped students better understand the disease processes described in the case, and enhanced awareness of the complexity of patient care.
Duke P, Cohen D, Novack D[26]	2009	*Using a Geriatric Mentoring Narrative Program to Improve Medical Student Attitudes towards the Elderly.*	Concurrent mixed methods study design (QUANT+QUAL) using pre-test, post-test surveys and narrative analysis	*n* = 55 (T1) and *n* = 71 (T2, but *n* = 55 used for analysis); *n* = 284 (4 narratives per student)	Year-long geriatrics mentoring program at an assisted living facility. Intended for first-year medical students to create and nurture positive attitudes toward the elderly. Involved senior patients who were not acutely ill. Students were given topic guidelines for discussions with their seniors. Prior to meeting their seniors, students attended a two-hour lecture on ageism by a geriatric social worker as well as an introduction to core geriatric topics.	Duration of the contact: Moderate (4x45-min interviews/conversations, with the same patient through the academic year) Patient autonomy during the encounter: Moderate (Students were previously given topic guidelines, but encounters took the form of conversations/interviews,	Majority of students enjoyed the experience of interviewing patients outside the classroom. The experience improved their attitudes over time. Students expressed growing empathy and insight into the lives of older people. Majority of students also felt that the relationship developed with their senior helped them better understand unique issues of communicating with seniors. The great

						leaving greater room for patients to tell their stories and emphasize what is important to them) Training for the patient: N/A Patient involvement in planning the encounter and curriculum: N/A Institutional commitment to patient involvement in education: N/A	majority showed an increased understanding of seniors' life experiences.
Fitzpatrick C, Musser A, Mosqueda L, Boker J, Prislin M[27]	2006	*Student Senior Partnership Program: University of California Irvine School of Medicine.*	Concurrent mixed methods study design (QUANT+qual) using pre- and post-test survey and qualitative feedbacks (after 1 year and at the end of the program)	*n* = 77 (pre-test) *n* = 72 (post-test)	Voluntary Student Senior Partner Program to: i. develop a longitudinal relationship with a "real" patient, ii. develop an understanding of healthcare issues older adults face, and iii. nurture positive attitudes toward older adults. Involved a culturally diverse group of senior patients. Three modules were required each year, with each based upon a set of specific learning objectives. A module consisted of a didactic presentation, a home visit of a senior partner, and a faculty-facilitated small group discussion. Module topics were selected through a consensus development process using the American Geriatric Society Core Competencies for medical student education as a guide for discussion. The program officially ends with the Goodbye module to reflect on the shared experiences and the meaning of the relationship.	Duration of the contact: Extensive (longitudinal relationship that continues throughout the first three years of medical school, at a rate of three times per year) Patient autonomy during the encounter: N/A Training for the patient: N/A Patient involvement in planning the encounter and curriculum: None (Patients were not involved in the consensus development process leading to the identification of the module topics). Institutional commitment to patient involvement in education: Low (Curriculum time for this particular program was assured through the Office of Curricular Affairs and provided on a "carve out" basis within existing courses)	Students expressed appreciation for having a live patient with whom they could interact without time constraints. Gratitude for the friendship and role modeling provided by the senior partners was also expressed. Results show significant positive overall change in student attitudes over the duration of the curriculum. Results also show significant overall improvement in students' general knowledge regarding older persons following exposure.
Frey J, Neeley B, Umer A, et al.[28]	2021	*Training in Neurology: Neuro Day, An Innovative Curriculum Connecting Medical Students With Patients*	Non-experimental quantitative study design using pre- and post-test surveys involving Likert scales and open questions	*n* = 50 (pre-test) *n* = 103 (post-test)	Pilot neurologic curricula aimed at teaching the neurologic examination, exposing early trainees to neurologic patients and increasing interest in the field of neurology. Intended for first-year medical students. The curricula consisted of 2 parts: i. an hour-long block to teach the neurologic examination and ii. a 3-hour interactive patient encounter experience. For the second part, medical students were divided into small groups of 10-11 students and rotated to meet different patients. A neurology faculty member or resident was assigned to each patient and discussed pathophysiology aspects with student groups. Patients were invited to share their personal experience with the disease. Students had the opportunity to ask questions and practice examinations.	Duration of the contact: Encounter based (1x4-h event (total), each patient encounter lasted about 15 minutes) Patient autonomy during the encounter: Low-Moderate (Patients were encouraged to talk about their own experience and to interact with students within the faculty-led curriculum) Training for the patient: N/A Patient involvement in planning the encounter and curriculum: N/A Institutional commitment to patient involvement in education: N/A	The teaching strategy that was rated the most useful for students was patient encounters. Students highlighted how patient encounters helped to instill a sense of professional identity as a physician and to encourage learning through personal connection. The experience also enabled students to empathize with individual patient stories.

George DR, Stuckey HL, Dillon CF, Whitehead MM[29]	2011	*Impact of Participation in TimeSlips, a Creative Group-Based Storytelling Program, on Medical Student Attitudes toward Persons with Dementia: A Qualitative Study*	Descriptive qualitative study design using course evaluation open-ended questions analysis	*n* = 15	Non-clinical, group-based creative storytelling program. Intended for fourth-year medical students to explore how they experience their own attitudes and perceptions of persons with Alzheimer's disease and related dementia (ADRD). Students are separated into two groups with 10 elders with ADRD. Each person is given surreal staged pictures, and participants (students and elders) are encouraged to use their imaginations to make observations and tell stories about the people and objects in those pictures. Every comment is written down in the form of a prose poem such that at the end of each session, students and elders have coauthored a collective story. Prior to the encounter, students attended an educational session at a retirement community to learn how to interact meaningfully with residents and what to do in the event of an emergency.	Duration of the contact: Moderate (4x90-min sessions) Patient autonomy during the encounter: Moderate-Extensive (Each patient is encouraged to develop his own narrative regarding the given picture, with no particular external direction or control) Training for the patient: N/A Patient involvement in planning the encounter and curriculum: N/A Institutional commitment to patient involvement in education: N/A	Students expressed a positive attitude toward the course overall and qualified the experience as novel and surprising. Interest was shown in learning about patients with dementia from a non-clinical viewpoint. Experience was also perceived as a source of personal growth. Results showed a perspective shift toward persons with dementia and helped eliminate some of the common misapprehensions. Students learned how to interact more meaningfully with people with dementia and acquired a new set of knowledge and experiences to draw from in their future practice.
Harris, M., Camenzind A.-L, Fankhauser R, Streit S, Hari R[43]	2020	*Does a home-based interview with a chronically ill patient help medical students become more patient-centred? A randomised controlled trial*	Randomised controlled trial	*n* = 317	Teaching module involving home visits to chronically ill patients and structured in-depth interviews using open-ended questions. Patients were invited to share their views on their illnesses and answer questions about the physical, psychological and social effects of these illnesses. Aims to encourage students to take a patient-centered approach. Intended for first-year medical students. Interviews were unaccompanied and conducted at the patients' own homes. A structured student-faculty teacher 30-min debriefing followed each home visit.	Duration of the contact: Encounter-based (1x60-90 minutes encounter) Patient autonomy during the encounter: Low-Moderate (Each patient is encouraged to develop his own narrative within the framework of a structured interview. Students were given an interview guide using open-ended questions to help elicit patients' narratives) Training for the patient: N/A Patient involvement in planning the encounter and curriculum: N/A Institutional commitment to patient involvement in education: N/A	Results indicated a significant increase in patient-centered attitudes during the study with no significant difference in score changes between the active intervention group and the control group (who were given a self-study document).
Hendriksz T[30]	2016	*Using Patient Perspective Sessions to Increase Empathy and Recall in Preclinical Medical Students.*	Non-experimental quantitative study design using post-test surveys involving rating scales and free text comments	*n* = 43	Mandatory patient perspective sessions in the osteopathic doctoring curriculum. Intended to address the issue of limited interaction with patients in the preclinical years by engaging real patients to present their medical stories to large groups of first- and second-year medical students. Involved patients living with chronic conditions or disabilities. The topics of the patient perspective sessions matched the physiologic system the students were studying at the time. During those sessions, patients were encouraged to talk about their experiences of illness and healthcare. A clinical	Duration of the contact: Encounter-based (four sessions in year 1 and three sessions in year 2, with different patients whose experience was matching the physiologic topic covered by the faculty-led curriculum) Patient autonomy during the encounter: Low-Moderate (Patients were encouraged to talk about their own experiences, more room was	Most students reported having enjoyed or greatly enjoyed the sessions. They particularly enjoyed the patient perspective sessions. For most students, the results showed that the sessions met the objective of enhancing empathy. The experience also allowed them to gain a new perspective.

					faculty member was present at all sessions to help facilitate the discussion and answer questions.	given for patients to talk about their experience of disease and healthcare and emphasize what is important to them. They were, however, asked to discuss topics related to the faculty-led physiological curriculum). Training for the patient: N/A Patient involvement in planning the encounter and curriculum: N/A Institutional commitment to patient involvement in education: N/A	
Henriksen AH, Ringsted C[31]	2014	*Medical Students Learning from Patient-Led Teaching: Experiential versus Biomedical Knowledge*	Descriptive qualitative study design using focus group interviews	*n* = 23	Optional teaching session called "Examination of back and peripheral joints". Intended for all medical students during the clinical phase of their education. Involved patient-instructors with rheumatism. The session involved examination of the back (planned and taught by rheumatologists) and peripheral joints (planned and taught by patient-instructors). In dialogue with the patient-instructors, students examined the patients' joints and learned about their lives as patients with a chronic illness.	Duration of the contact: Encounter-based (1x6-h training session, students were split into small groups and met three different patients) Patient autonomy during the encounter: Moderate-High (Courses were usually taught by the patients only; patients were expected to establish dialogue and teach students about their lives as patients with a chronic illness, while leaving room for patients to tell their story and emphasize what is important to them; patients' authentic responses to the students; and attitudes and attentiveness also served as formative assessments of the learning) Training for the patient: N/A Patient involvement in planning the encounter and curriculum: Moderate-High (Courses were usually planned by the patients only). Institutional commitment to patient involvement in education: N/A	Individual perspective and the realism brought through the patient sessions were considered very important. Students were sceptical about whether to consider it as legitimate teaching. Results showed students wished for more theoretical and structured teaching. Experience allowed the acknowledgement of the value of the patients' experiential knowledge.
Hoffman KG, Gray P, Hosokawa MC, Zweig SC[32]	2006	*Evaluating the Effectiveness of a Senior Mentor Program: The University of Missouri-Columbia School of Medicine.*	Descriptive and exploratory qualitative design using focus group interviews	*n* = 9 (students), *n* = 7 (community-living seniors), *n* = 8 (practicing geriatrician)	Senior Teacher Educator Partnership program linking first-year medical students with community-based seniors for a duration of 2 years. Focused on learning the partner's stories and knowing the partner as a person to illicit positive student views and attitudes regarding older people. Involved community living seniors.	Duration of the contact: Extensive (sessions and luncheons occurred eight times a year + other students/patients arranged social activities) Patient autonomy during the encounter: N/A Training for the patient: N/A	Students mentioned that formal, planned activities were not as rich as the time spent one on one, and had less influence on participants' perceptions of each other. Students showed a change in attitude toward seniors and their reality.

					Involved planned group sessions and luncheons. Other student and elder-arranged social activities could also be held.	Patient involvement in planning the encounter and curriculum: Low (Core activities include luncheons and presentations on health topics interesting to both the patients and the students. We therefore assume some mechanism for acknowledging patients' preferences and interests) Institutional commitment to patient involvement in education: N/A	
Ivory KD, Luscombe G, Klein LA, Barratt A[40]	2017	*"Thank You for Giving Me a Voice!" A Longitudinal Evaluation of Patients' Experience of Partnering With Students in an Australian Medical School*	Longitudinal cohort study using pre- and post-test surveys including rating scales and open questions	n = 155 patient-partners (T0), n = 90 (T1), n = 64 (T2)	Longitudinal Patient Partnership aimed to expose senior medical students to the intersection of population medicine principles, clinical practice, and professional skills through exposure to the lived experience of chronic disease and disability. Intended to foster an understanding of the effects of culture and marginalization on health outcomes. Each student was responsible for recruiting and arranging meetings with the patient. Students' preparation for the partnership involved a 2-hour diversity workshop.	Duration of the contact: Extensive (patient-student meetings every 2 months to cover the topics required in the program; the total duration of the program is not specified) Patient autonomy during the encounter: Moderate (Students were previously given topic guidelines, but patients were free to discuss any relevant aspects of their care. Encounters take the form of conversations/interviews, leaving greater room for patients to tell their stories and emphasize what is important to them) Training for the patient: Brief, Simple (Patients' preparation involved reading written guides, participant information in community languages, simple consent documents describing the role of patients and students) Patient involvement in planning the encounter and curriculum: N/A Institutional commitment to patient involvement in education: N/A	Patients perceived a significant improvement over time concerning the students' respect for cultural background and beliefs. According to patients, students improved their understanding of the role of the social determinants of health and the daily impact of chronic conditions. The role of the doctor as an advocate and the impact of the direct and indirect healthcare costs were also noted.
Jha V., Buckley H, Gabe R, et al.[41]	2015	*Patients as teachers: a randomised controlled trial on the use of personal stories of harm to raise awareness of*	Multi-centre, two-arm, parallel designed randomised controlled trial	n = 283	Intervention intended to facilitate safety training amongst FY1 medical trainees. Involved patients with personal experiences of error of harm during medical diagnosis, treatment or care. Each session involved one patient's in-person shared narrative followed by an interactive co-facilitated discussion. The patient narratives were used to focus both on the specific issues	Duration of the contact: Encounter-based (2x1-h sessions) Patient autonomy during the encounter: Moderate-High (Patients were invited to share their narrative and to co-	Students from the intervention group (exposed to patient involvement) showed higher positive and negative emotional response to the course than students from the control group (exposed to regular teaching). Intervention group showed an average increase in positive emotional response

		patient safety for doctors in training			around the individual patient story as well as more generic issues around patient safety. Each narrative included a factual description of what happened and reflections about their experience with medical error. The discussion that followed was interactive, with facilitation by a trained independent chairperson along with the patients.	facilitate the following interactive discussion) Training for the patient: Extensive (1 open house session to receive information and confirm interest + 4 Preparatory Learning Journey workshops to help patients co-develop their individual stories + briefings before and after the teaching sessions) Patient involvement in planning the encounter and curriculum: High (Sessions were co-developed with patients. Patients were also involved in defining intervention objectives and outcome measures). Institutional commitment to patient involvement in education: N/A	pre-post test (in comparison with an average decrease for the control group). Both groups showed an average increase in negative emotional response pre-post test. Statistically significant differences between the intervention and control group suggest the intervention may have had a particularly high impact on students' perceptions of the importance of the patient's role in patient safety issues. Results also show differences between the intervention and control group regarding the central learning gained from the course.
Jha V, Winterbottom, A, Symons J et al.[33]	2013	*Patient-led training on patient safety: a pilot study to test the feasibility and acceptability of an educational intervention*	Sequential mixed methods quasi-experimental design (QUANT ▯ qual) using a non-randomised controlled trial and follow-up interviews	*n* = 250 (RDC), *n* = 6 (interviews)	Intervention intended to facilitate safety training amongst FY1 medical trainees. Involved patients with personal experiences of error of harm during medical diagnosis, treatment or care. Each session involved one patient's in-person shared narrative followed by an interactive co-facilitated discussion. The patient narratives were used to focus both on the specific issues around the individual patient story as well as more generic issues around patient safety. Each narrative included a factual description of what happened and reflections about their experience with medical errors. The discussion that followed was interactive, with facilitation by a trained independent chairperson along with the patients.	Duration of the contact: Encounter-based (2x1-h sessions) Patient autonomy during the encounter: Moderate-High (Patients were invited to share their narrative and to co-facilitate the following interactive discussion) Training for the patient: Extensive (1 open house session to receive information and confirm interest + 4 Preparatory Learning Journey workshops to help patients co-develop their individual stories + briefings before and after the teaching sessions) Patient involvement in planning the encounter and curriculum: High (Sessions were co-developed with patients. Patients were also involved in defining intervention objectives and outcome measures). Institutional commitment to patient involvement in education: N/A	Response to patient involvement was largely positive. The opportunity for discussions allowed for better interactions. Frustration was expressed by some students who felt the patient stories were too complex and beyond their scope as junior doctors. Some students also felt intimidated and fearful at the attitude of patients. Some felt anxious about sessions not containing enough practical knowledge. Some students felt engaged by the power of real stories and pleased that patients were given a voice. Results showed the experience allowed for appreciation and highlighted the importance of being more patient-centered, listening to patients and challenging colleagues to protect patients.
Kangasjarvi E, Ng SL, Friesen F, Simpson JS[34]	2020	*Patients as teachers and arts-based reflection in*	Descriptive and explorative qualitative study	*n* = 46	Program integrated into the third-year surgical clerkship for undergraduate medical students.	Duration of the contact: Encounter-based (3x60-75 min interactive workshops)	Students perceived patients' stories as powerful, insightful, eye opening, valuable, enlightening and inspiring.

		surgical clerkship: A preliminary exploration	design using focus groups and one-on-one interviews.		Consists of three interactive workshops and the creation of an arts-based reflection piece. In the two first workshops, patient teachers share their stories, discuss how illness has impacted their lives and reflect on their experiences with the healthcare system. Students are encouraged to engage in dialogue with patient teachers and ask questions. A trained healthcare professional facilitates the sessions. In the last workshop, students are invited to reflect on personal experiences and assumptions on the effects of surgery and chronic illness and on the patient-surgeon relationship. Students then produce an arts-based reflection, which forms the basis for a group discussion.	Patient autonomy during the encounter: Moderate-High (patient teachers choose which part of their illness journey they want to share, in what detail, and what aspects of it they want to emphasize). Training for the patient: Brief, simple but structured (a storytelling workshop) – no more information available on the content and length. Patients also had constant access to a social worker to discuss issues arising from their participation. Patient involvement in planning the encounter and curriculum: Moderate (3 patients met as a group with a social worker to go over the session and together decided on the “key messages” to deliver). Institutional commitment to patient involvement in education: N/A	The sessions were perceived as important since they allowed protected time to listen to and learn from patient-teachers’ in-depth narratives. Students learned about how significant, meaningful and impactful each interaction with healthcare providers feels for patients. The experience also contributed to perceiving the patient as more than just an illness or a care plan. Students were allowed to see the plurality of patients’ experiences and stories, suggesting that each patient should be treated as a unique individual.
Kumagai AK, Murphy EA, Ross PT[42]	2009	*Diabetes Stories: Use of Patient Narratives of Diabetes to Teach Patient-Centered Care*	Qualitative study design using Grounded Theory methodology and in depth face-to-face interviews	*n* = 12	Required course implemented as part of a new first- and second-year curriculum to train physicians in understanding the complexities of clinical medicine and the personal and psychosocial aspects of illness and its care. Involved patients with type 1 and type 2 diabetes. Pairs of medical students make scheduled visits to the homes of volunteer patients and their families.	Duration of the contact: Extensive (home visits over 2 years, to the same patients during the full 2 years) Patient autonomy during the encounter: Moderate (patients were invited to share their experience with illness, leaving space for them to share their stories and focus on what is important to them; patients were, however, not involved in the following discussion sessions) Training for the patient: N/A Patient involvement in planning the encounter and curriculum: N/A Institutional commitment to patient involvement in education: N/A	Students reported renewed motivation to develop as physicians and incorporate lessons from the patients' stories into their own approach. The experience also contributed to reaffirming or stimulating their interest in preventative care in primary care settings. The experience helped students contextualize the disease in individual lives and unique perspectives. It was also an opportunity to adopt the patient's perspective and develop an awareness of one’s own privileges. Impacts on students' general views of medicine and life were also reported. Students gained a new understanding of how chronic illness impacts someone’s life on a daily basis.
Owen C, Reay RE[35]	2004	*Consumers as tutors - legitimate teachers?*	Non-experimental quantitative design using pre and post-test survey including	*n* = 72 pre-test, *n* = 68 post-test (attitudes questionnaire), *n* = 452 (tutorial evaluation, by students and tutors at each of the 6 sessions)	Innovative approach to teaching psychiatric interview skills. Intended for 4th-year psychiatric medical students. Involved patients from a local mental health patient network. Involved tutorials delivered by pairs of patient-tutors to small groups of six to eight students.	Duration of the contact: Encounter-based (6x1-h tutor-led tutorials) Patient autonomy during the encounter: High (Patients independently facilitated and	Students largely reported positive experiences and saw tutors' experience and knowledge as legitimate and valuable. Results suggest a general trend towards further improvement in students' attitudes towards learning

			rating scales and open questions		Tutorials included the discussion of the pertinent issues, practices, review by the students and feedback from peers and patient-tutors.	participated in the tutorial without the involvement of academic staff) Training for the patient: Structured and extensive (Patients attended 6 1.5-h preparation sessions. Debriefing with academic staff was encouraged after each tutorial. Occasional workshops were planned to support tutor participation) Patient involvement in planning the encounter and curriculum: Moderate-Extensive (Steering committee involving patients determined the priorities for the student curriculum and oversaw the writing of tutorials with academic staff. Patients were involved at all stages of the intervention: planning, development, implementation and evaluation. Institutional commitment to patient involvement in education: N/A	from consumers and working with mental health clients. Results also show an increase in students' ability to build a relationship and to engage and understand the patient.
Player E, Gure-Klinke H, North S, et al.[36]	2019	*Humanising medicine: teaching on tri-morbidity using expert patient narratives in medical education*	Qualitative case study design using pre- and post-qualitative questionnaires and informal interviews	$N = 102$	Teaching intervention implemented within a 50-min compulsory lecture as part of the core medical curriculum. Intended for Year Four medical students. Aimed at understanding patient and students' experiences of narrative medicine in the context of tri-morbidity (i.e. a history of co-existing but not causal substance misuse, physical and mental health problems, often associated with homelessness). Researchers and marginalized expert patients delivered the lecture together, taking turns to discuss and illustrate the themes. Each theme was illustrated with examples from expert patient narratives.	Duration of the contact: Encounter-based (3x50-min lecture) Patient autonomy during the encounter: Moderate (Patients were co-teachers and had to formulate their own narrative to illustrate predetermined contents; therefore, they were not completely independent) Training for the patient: N/A Patient involvement in planning the encounter and curriculum: N/A Institutional commitment to patient involvement in education: N/A	Students reported a rich learning experience. The experience contributed to learning concerning the importance of compassionate, human and holistic care. It also improved empathy and the understanding of the complexity experienced by marginalised people when accessing healthcare.
Shapiro D, Tomasa L, Koff NA[37]	2009	*Patients as teachers, medical students as filmmakers: the video slam, a pilot study*	Non-experimental quantitative design using post-test questionnaires involving rating scales and open questions	$n = 32$ ($n = 10$ at Year 1, $n = 22$ at Year 2; 4 students didn't complete the project)	Filmmaking to directly learn about chronically ill patients' lives. Intended for second-year medical students. Involved a diverse range of chronically ill patients. Students took part in the project voluntarily.	Duration of the contact: Extensive (3-6 home visits + accompanying patients to medical visits and other daily activities during eight months) Patient autonomy during the encounter: Moderate (the project involved active observation and listening;	Results indicate the experience had a relatively significant impact on students' medical education. Results also show the experience had a positive impact on students' willingness to involve patients in directing their own care and students' thinking about what should or should not be covered during a clinical visit.

						patients were free to decide what to share with students) Training for the patient: Brief, simple (Initial discussion to state the role of patients as experience experts + the role of students as learners) Patient involvement in planning the encounter and curriculum: N/A Institutional commitment to patient involvement in education: N/A	The experience fostered learning about the impact of illnesses on patients' relationships, helped students understand patients' psychological responses to illness and helped them learn about environmental challenges patients face.
Stojan JN, Sun EY, Kumagai AK[38]	2019	*Persistent influence of a narrative educational program on physician attitudes regarding patient care*	Descriptive qualitative study design using individual face-to-face interviews	*n* = 19	Pairing of medical students with individuals and families who lived with chronic illness for a series of scheduled home visits over two years during the 1st and 2nd years of the pre-clinical curriculum. Aimed to enhance empathy and patient-centered care. Home visits were devoted to ongoing conversations between students and patients about their experience in living with chronic illness. Students were instructed to focus on being fully present to hear the stories patients would tell. Following each home visit, small group-based interactive discussions were held to stimulate reflection on the stories heard.	Duration of the contact: Extensive (series of home visits over 2 years) Patient autonomy during the encounter: Moderate (conversations were intended to be focused on certain predefined themes: the impact of illness on self and family, the interactions between doctors and patients, the stigmatization of illness, and breaking bad news; patients were not involved in following small group-based interactive discussions) Training for the patient: N\A Patient involvement in planning the encounter and curriculum: N/A Institutional commitment to patient involvement in education: N/A	From a longitudinal perspective, participants mentioned the program: i. heighted awareness of the patient's perspective of illness and developed a unique impression of disease from the patient's family's point of view; ii. impacted their style of patient care and how they viewed communication, empathy and compassion; iii. influenced teaching styles and career choices, sparking their interest in a particular field of medicine.